

ORIGINAL ARTICLE

Validation of an uncertainty of illness scale adapted to use with Spanish emergency department patients and their accompanying relatives or friends

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Objective. To validate a Spanish adaptation of the Mishel Uncertainty of Illness Scale for use with emergency-department (ED) patients and their accompanying relatives or friends (the UIS-ED).

Methods. We first developed a version of the questionnaire for Spanish ED situations. Next we assessed the content validity index for each of its items, revised it, and reassessed its face validity to produce a second version, which we then piloted in 20 hospital ED patients. A third revised version was then validated in a population of 320 adults (160 patients and 160 accompanying persons) who attended the ED between November 2015 and September 2016. The 12-item UIS-ED (60 points) was administered by 2 nurses while the patients and accompanying persons were in the ED. We gathered sociodemographic and clinical data as well as the subjects' perception about the information they were given.

Results. The mean (SD) uncertainty score among patients was 29 (11) points. Accompanying persons had a mean score of 36 (13) points. Factorial analysis confirmed the instrument's construct validity, finding that both dimensions of the original Mishel scale (complexity and ambiguity) were present in 6 items each. Factorial analysis explained 60% of the total variance in the patient version and 67% of the variance in the version for accompanying persons. Reliability statistics were good, with Cronbach's α values ranging from 0.912 to 0.938. Split-half reliability statistics ranged from 0.901 to 0.933. Correlations were significant in the analysis of convergent validity.

Conclusion. The UIS-ED questionnaire may prove to be a simple, valid, and reliable way for assessing uncertainty in patients and their accompanying friends or relatives attending Spanish EDs.

Keywords: Uncertainty. Emergency department. Surveys and questionnaires. Validation.

Validación de la Escala de Incertidumbre ante la Enfermedad en pacientes y acompañantes que acuden a un servicio de urgencias

Objetivo. Validar la Escala de Incertidumbre ante la Enfermedad en los pacientes y los acompañantes de un servicio de urgencias hospitalario (SUH).

Método. La validación de contenido incluyó el desarrollo de una versión adaptada a urgencias mediante consenso (versión 1), una versión tras validación del contenido (versión 2) y una versión tras un estudio piloto en 20 usuarios del SUH (versión 3). El estudio de validación se realizó en 320 sujetos adultos (160 pacientes y 160 acompañantes) que acudieron a un SUH entre noviembre de 2015 y septiembre de 2016. La Escala de Incertidumbre ante la Enfermedad en el Servicio de Urgencias (ESINESU) constó de 12 ítems (60 puntos) y fue administrada por dos enfermeras durante la estancia de los pacientes y los acompañantes en el SUH. Se recogieron variables sociodemográficas, clínicas y de la percepción sobre la información recibida.

Resultados. El grado de incertidumbre fue de 29 (DE 11) puntos en pacientes y 36 (DE 13) puntos en acompañantes. El análisis factorial confirmó, en las pruebas de validez de constructo, las dos dimensiones de la escala original (complejidad y ambigüedad), con 6 ítems en cada una de ellas. Dicho análisis factorial explicó un 60% de la variancia total en la versión de la escala para pacientes, y un 67% en la versión para acompañantes. Los valores de fiabilidad obtenidos fueron buenos, alfa de Cronbach de 0,912-0,938 y procedimiento de dos mitades 0,901-0,933. La validación convergente también mostró correlaciones significativas.

Conclusiones. La ESINESU podría ser una escala sencilla, válida y fiable para medir la incertidumbre de pacientes y acompañantes en los SUH españoles.

Palabras clave: Incertidumbre. Servicio de Urgencias. Encuestas y Cuestionarios. Estudios de Validación.

Introduction

The concept of uncertainty, applied to health, is defined as the personal inability to attribute meaning to

events related to the disease process¹. The Mishel Theory proposes that uncertainty increases in ambiguous, complex and unpredictable situations of illness, and when the necessary information is not available or is in-

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All authors have confirmed their authorship in the author's responsibilities documents publication agreement and assignment of rights to EMERGENCIAS.

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Article information:

Received: 28-4-2017
Accepted: 10-12-2017
Online: 7-2-2018

Editor in charge:

Francisco Javier Martín-Sánchez, MD, PhD.

consistent. When the uncertainty is high, there is greater psychological stress in those suffering from acute or chronic diseases. Hospital admissions are situations that alter the familiarity of expected events and increase the degree of uncertainty².

The Mishel Theory has been used in the context of numerous diseases, patient profiles and care environments. Its scale to measure the degree of uncertainty has been widely applied and adapted in different populations, resulting in a valid and reliable instrument³. Thus, a high degree of uncertainty has been found in family members of patients admitted to intensive care units⁴. However, it has not yet been tested in hospital emergency services (HES). People who come to a HES, patients or companions, suffer stress, anxiety and coping difficulties⁵. Lack of information and waiting times worsen satisfaction and may increase the degree of uncertainty. This would require programming appropriate measures for improvement in the form of educational or informative interventions⁶. Therefore, the objective of our study was to validate the Spanish version of the Uncertainty of illness Scale (UIS) in patients and those accompanying an HES.

Method

A validation study of the Spanish version of the UIS was designed, starting with the 23-item version of Mishel Uncertainty in Illness Scale-Community Form⁸ (MUIS-C) adapted by Torres and Peña⁷, among the subjects that attend an HES.

In the first place, the content validation was carried out and then the validation in the emergency population. The content validation was carried out in two phases. In the first, a version adapted to the emergency department was prepared. For this, the research team, formed by three nurses with a minimum of two years of experience in the emergency room, two clinical psychologists and a methodologist, discussed and agreed on the statements of the Spanish version of the MUIS-C, thus obtaining a first version of the scale (version 1).

In the second phase, the validity of the quantitative content of the obtained version was calculated using the Lawshe⁹ formula. He was subjected to critical judgment by a different group of experts formed by eight nurses from the HES, with the same experience, who evaluated each item in the following categories: essential, dispensable or unnecessary. As a result of this evaluation, the content validity index (CVI) of each item was calculated. Next, the research team carried out a new qualitative analysis of the apparent validity and content of this reduced version, obtained by eliminating the items that did not obtain values equal to or greater than 0.75 in the CVI, considering the second version as good (version 2). Subsequently, a pilot study was carried out with a sample of 20 users of the HES of the University Hospital Complex of the Canary Islands (CHUC). During this process, com-

prehension and completion times were assessed, and it was found that patients and companions responded to all the items and recognized that the sentences on the scale corresponded to a colloquial language. The pilot test took into account the observations of the participants, including new items or modifying existing ones, forming the third version of the scale (version 3).

Validation in the emergency department was carried out in the HES of the CHUC, Tenerife, between November 2015 and September 2016. Patients and adult companions who attended the HES were included and, after being informed of the study's objectives, they consented to participate in writing. We excluded patients with cognitive problems or pathologies that prevented them from understanding the purpose of the research and answering the questions asked. The sampling was non-probabilistic of incidental type. The questionnaires were administered by two HES nurses during the emergency wait. The selection of companions was made in the waiting room, without identifying the degree of kinship, nor being necessary that these were relatives of the same participating patients. The nurses handed the questionnaire emphasizing the veracity of the answers and preserving the anonymity.

In this validation phase variables such as age (years), sex (male/female), level of studies (without studies, primary, secondary or vocational training, university), recent visits to HED (yes/no), the number of visits in the last 6 months, the previous search on the internet for information related to the reason for the visit (yes/no) and the reason for the current visit (open response categorized a posteriori). In addition, it was asked about the waiting time from the last information received (in hours), by the perception of it in terms of quantity, clarity, waiting time and quality. These four aspects were scored by participants on a Likert scale between 1 (very bad) and 5 (very good). The responses to the items of the uncertainty scale were also scored according to a Likert scale, between 1 (no agreement) and 5 (very much in agreement). In the analysis phase, secondary variables were constructed: the sum of the level of perception (with values between 4, worse perception, and 20, better perception possible); the category of perception level (poor / fair / good, based on responses on the Likert scale); and the sum of the level of uncertainty (with values between 12, less uncertainty, and 60, greater uncertainty possible). The sample size was calculated for a power of 95% in the estimation of correlations of magnitude not inferior to 0.27, in bilateral tests of hypothesis contrast with a level of statistical significance of 0.05, being necessary 320 people (160 patients and 160 companions).

The quantitative variables were expressed as mean and standard deviation, or median and interquartile range if the distribution did not meet the normality principles, while qualitative variables were described by absolute number and frequency. For the validity of

the construct, a factorial analysis of the main components with Varimax rotation was carried out, with the intention of finding the same dimensions defined for the original MUIS-C scale⁸ and for the Spanish adaptation⁷. The adequacy of the factorial analysis was evaluated using the Kaiser-Meyer-Olkin test and Bartlett's sphericity test. For the internal consistency and reliability of the instrument, the Cronbach alpha coefficient and the two halves test were calculated with the Spearman-Brown correction (odd-even). The convergent validity was determined by correlating the uncertainty scores with those obtained for the variables of perception of the information. For the analysis of these associations, Spearman's correlation coefficient and Student's t were used. To compare the degrees of uncertainty between patients and companions, Student's t was used, as well as for comparison with sex, recent visits to the HES, prior consultation on the Internet and waiting times (0-6 hours; 6 hours). The comparisons between the degree of uncertainty and the categorized age, and between the level of studies

and the reason for the visit, were made through the ANOVA test. All hypothesis test tests were bilateral, and statistical significance was accepted if $p < 0.05$. The calculations were made with the statistical package SPSS 21.0 (IBM, NewCastle, NY, USA).

Results

In the first phase of the content validity process, the panel of experts modified the wording of 9 items in the version for patients and 19 items in the version for the companions, thus forming the first version of the scale in its adaptation to the field of HES (Table 1). Both versions include the same items, although with variations in the statement to adapt to the role of each respondent.

In the second phase, the CVI were calculated according to the Lawshe formula, according to the judgment of eight experts (Table 1). The second version of the scale was made up of 11 statements, after elimi-

Table 1. Validation of content of the Uncertainty Scale before the Illness in the Emergency Department (first and second version)

Spanish version of the Uncertainty Illness Scale ¹	Scale of Uncertainty illness scale for patients and companions that go to HES. First version	Expert panel								CVI	Scale of Uncertainty illness scale for patients and companions that go to HES. Second version
		1	2	3	4	5	6	7	8		
1. I don't know what's wrong with me	Pat: I don't know what's wrong with me Comp: I don't know what's wrong with him/her	E	E	P	P	E	E	E	E	0.5	Eliminated
2. I have many unanswered questions	Pat: I have many questions about my health problem Comp: I have many questions the health problem	E	E	E	E	E	P	E	E	0.75	It remains the same
3. I do not know whether I'm getting better or worse	Pat: I do not know if I'm getting better or worse Comp: I do not know if he/she is going to get better or worse	E	E	E	E	E	E	E	E	1	It remains the same
4. I'm worried about being in pain or having unpleasant symptoms	Pat: I'm worried about being in pain or having unpleasant symptoms Comp: I'm worried about him/her being in pain or having unpleasant symptoms	E	E	E	E	E	E	E	E	1	It remains the same
5. The explanations they give me about my illness seem confusing	Pat: The explanations they give me about the problem seem confusing	E	E	E	E	E	E	E	E	1	It remains the same
6. I understand why and what for I'm receiving this treatment	Pat: I understand why and what for I'm receiving this treatment Comp: I understand why and what for he/she is receiving this treatment	P	E	E	E	E	E	E	E	0.75	It remains the same
7. My symptoms change from one day to the next	Pat: my symptoms change from one day to the next Comp: The symptoms change from one day to the next	I	P	I	I	P	P	P	P	-1	Eliminated
8. I understand everything they explain me	Pat/Comp: I understand everything they explain me	E	P	P	E	E	I	P	E	0	Eliminated
9. The doctors tell me things that can be interpreted in different ways	Pat/Comp: the doctors tell me things that can be interpreted in different ways	E	E	P	E	E	E	E	E	0.75	It remains the same
10. My treatment is too complicated to understand it	Pat: My treatment is too complicated to understand it Comp: The treatment is too complicated to understand it	P	I	P	P	I	I	P	P	-1	Eliminated
11. It is difficult to know if this treatment improves my disease	Pat: It is difficult to know if this treatment improves my disease Comp: It is difficult to know if this treatment improves his/her disease	P	E	I	I	P	P	E	E	-0.25	Eliminated

(Continue)

Table 1. Validation of content of the Uncertainty Scale before the Illness in the Emergency Department (first and second version) (Continuation)

Spanish version of the Uncertainty Illness Scale ¹	Scale of Uncertainty illness scale for patients and companions that go to HES. First version	Expert panel								CVI	Scale of Uncertainty illness scale for patients and companions that go to HES. Second version
		1	2	3	4	5	6	7	8		
12. I cannot make plans for the future because I do not know how my disease will evolve	Pat: I cannot make plans for the future because I do not know how my disease will evolve Comp: It is not possible to make plans for the future because we do not know how the disease will evolve	P	P	P	P	I	P	E	E	-0.50	Eliminated
13. My illness changes at times, I have good days and bad days	Pat: My illness changes at times, I have good days and bad days Comp: The illness changes at times, he/she has good days and bad days	P	P	E	P	P	I	I	P	-0.75	Eliminated
14. I have been given different opinions about my illness	Pat: I have been given different opinions about my illness Comp: We have been given different opinions about his/her illness	E	E	E	E	E	E	P	E	0.75	It remains the same
15. Since I have this disease I don't know what will happen to me	Pat: Since I have this disease I don't know what will happen to me	E	E	E	E	E	P	E	E	0.75	It remains the same
16. the tests' results are contradictory	Pac/Comp: The information about the tests' results seems confusing	P	E	E	E	E	E	E	E	0.75	It remains the same
17. The effectiveness of the treatment is not safe	Pat/Comp: the effectiveness of the treatment is not safe	P	P	E	E	E	E	P	E	0.25	Eliminated
18. Due to my treatment, I don't know how will I be tomorrow or what will I be able to do	Pat: Due to my treatment, I don't know how will I be tomorrow or what will I be able to do Comp: Due to the treatment, I don't know how will she/he be tomorrow or what will we be able to do	P	I	E	P	P	P	E	E	-0.75	Eliminated
19. I'm sure they will not find anymore problems	Pat/Comp: I'm sure they will not find anymore problems	E	P	P	I	E	E	P	P	-0.75	Eliminated
20. the treatment I receive is proven to work	Pat: the treatment I receive is proven to work Com: the treatment he/she is receiving is proven to work	E	E	P	E	E	E	E	E	0.75	It remains the same
21. I have not been told exactly what illness I have	Pat: I have not been told exactly what illness I have Comp: I have not been told exactly what illness he/she has	E	E	P	E	P	E	E	P	0.25	Eliminated
22. The stage in which my disease is, has been identified	Pat/Comp: the stage in which the disease is, has been identified	P	I	P	E	E	P	P	I	-0.50	Eliminated
23. The doctors and nurses use simple language, so I can understand what they are explaining to me	Pat/Comp: the doctors and nurses use simple language, so I can understand what they are explaining to me	E	E	E	E	E	E	E	E	1	It remains the same

¹Community version adapted to Spanish by Torres and Peña (2015).

HES: hospital emergency service; Pat: patient version; Comp: version for companions; E: essential; D: dispensable; U: unnecessary; CVI: Content validity index.

nating the 12 items with values less than 0.75. The reduction of items was evaluated by the research team and agreed upon by the qualitative analysis of experts, considering that no information was lost when the items were in other statements or were not relevant for users.

The pilot test obtained short response times in the completion, between 2 and 4 minutes, and a positive consideration in terms of understanding and the meaning of the aspects asked. After this pilot test and given the observations of the participants about their concern regarding the resolution of the problem at discharge, the research group agreed and decided to

add a new item, the number 12: "I do not know if when I leave here the problem will be solved ", thus obtaining the third version of the scale (version 3).

In the validation phase of this new version of 12 items, the Uncertainty Scale for Illness in the Emergency Department -ESINESU-, 320 adult subjects were included (160 patients and 160 companions). The mean age was 55.2 (SD 14.1) years in the patients and 46.4 (SD 12.9) years in the companions. Table 2 shows the sociodemographic and clinical data. Table 3 shows the answers to each item of the uncertainty scale. Table 4 documents the perception of the information received. Figure 1 reflects the stratification of

Table 2. Sociodemographic and clinical data of patients and companions

Variables	Patients N = 160 n (%)	Companions N = 160 n (%)
Sex		
Male	93 (58.1)	36 (22.5)
Female	67 (41.9)	124 (77.5)
Group of age		
18 to 40	24 (15)	50 (31.3)
41 to 60	87 (54.4)	88 (55)
> 60	49 (30.6)	22 (13.8)
Level of studies		
Without studies	36 (22.5)	9 (5.6)
Primary	63 (39.4)	52 (32.5)
Secondary or VE	43 (26.9)	71 (44.4)
University students	18 (11.3)	28 (17.5)
Previous visits to the HES*		
Yes	71 (44.4)	66 (41.3)
No	89 (55.6)	94 (58.8)
Pre-check on the internet**		
Yes	29 (18.1)	40 (25.0)
No	131 (81.9)	120 (75.0)
Reason for visiting the HES		
Cardiovascular problems	34 (21.3)	25 (15.6)
Digestive problems	30 (18.8)	25 (15.6)
Respiratory problems	24 (15.0)	21 (13.1)
Neurological problems	17 (10.6)	21 (13.1)
Traumatological problems/ musculoskeletal	15 (9.4)	20 (12.5)
Other	40 (25)	48 (30.0)
Time since last received information		
0 to 3 hours	94 (58.8)	53 (33.1)
3 to 6 hours	41 (25.6)	26 (16.3)
6 to 12 hours	4 (2.5)	29 (18.1)
More than 12 hours	21 (13.1)	52 (32.5)

VE: Vocational education. HES: hospital emergency service.
*During the last six months. **Regarding the reason for the visit to the emergency room.

the degree of uncertainty according to the variables age, sex, level of studies, recent visits to the HES, previous search on the Internet and reason for visiting the HES.

Regarding the validity of the construct, we found Kaiser-Meyer-Olkin sample adequacy measures of 0.89 for patients and 0.94 for companions. Bartlett's sphericity test yielded statistically significant results ($p < 0.001$), verifying significant relationships between attributes, and enabling confirmatory factor analysis. This analysis corroborated two explanatory factors of 60% of the total variance in the sample of patients and 67% in that of companions.

Table 5 shows the psychometric indicators for each item of the scale and its factorial saturations. Each factor or dimension included 6 items, both in patients and companions. In the patient version, the first dimension, called complexity, is calculated by the sum of items 1, 4, 5, 6, 7 and 11. It covers aspects related to information, knowledge or complexity regarding the health problem, and the therapeutic indications. The second dimension, called ambiguity, includes items 2, 3, 8, 9, 10 and 12, being statements associated with prognosis and evolution, which define vague or diffuse situations about the disease state. Items 1

and 10 differ in their dimensional location between the version of the patients and that of the companions. This difference is logical because the position and perspective of the person surveyed is different. Thus, in the version of companions, the first dimension includes items 4, 5, 6, 7, 10 and 11, while the second dimension includes items 1, 2, 3, 8, 9 and 12. On the other hand, item 3 of the patient version and item 9 of the accompanying version obtained similar factor loads, being located, by decision and consensus of the research team, in the dimensions opposite to the ones with greater numerical load.

In reference to reliability, the internal consistency values of Cronbach's alpha were 0.91 and 0.94 respectively, and those obtained with the two halves procedure, 0.90 and 0.93.

Concerning the convergent validity, these tests showed significant correlations between the global degree of perception and that of uncertainty, so that, to worse perception, greater uncertainty (Spearman coefficients of -0.77 for patients and -0.82 for companions, $p < 0.001$). Statistically significant differences were found with respect to each category of perception, with greater uncertainty when the perception, in any of the four aspects assessed, was bad or very bad for both groups (Table 6).

The degree of uncertainty was greater in the companions than in the patients (35.8 [SD 12.9] points vs 29.2 [SD 10.8], $p < 0.001$); and in users with more than 6 hours compared to those with 6 or less waiting times in the emergency department (39.5 [SD 12.5] points vs 29.1 [SD 10.7], $p < 0.001$).

Figure 1 shows the stratification of the degree of uncertainty according to the variables age, sex, level of studies, recent visits to the HES, previous search on the Internet and reason for the visit. In relation to age groups, and within the patient category, more uncertainty was found in those over 60 compared to the group of 41-60 years (33.2 [SD 1.93] vs 26.7 [SD 10,0] points, $p = 0.002$). In the companion category, the uncertainty was higher in the group of 18-40 years compared to those over 60 years (39.3 [SD 10.2] points vs 32.7 [SD 11.9] points; $p = 0.029$). According to the reason for the visit, differences were found among the users who came for neurological problems compared to those who did so due to respiratory problems (37.9 [SD 11.7] points vs 29.4 [SD 11.3] points; $p = 0.038$). No significant differences were found in the degree of uncertainty with regard to sex, recent visits, prior consultation on the Internet or the level of studies.

Discussion

The present results show that we have a valid and reliable instrument (ESINESU) to measure the degree of uncertainty in patients and companions who attend a HES. The evidence of apparent validity, content and construction, as well as internal consistency and reliabi-

Table 3. Response values for each item of ESINESU

Items of the ESINESU for patients * and companions**	Score assigned on the Likert scale (%)					% negative answers ¹	% positive answers ²
	1	2	3	4	5		
1. I have a lot of questions about my /the illness							
Patient	24.4	24.4	12.5	30.0	8.8	38.8	48.8
Companion	16.9	17.5	6.9	31.1	27.5	58.8	34.4
2. I don't know if I/he/she will get better or worse							
Pacientes	25.6	26.9	6.9	30.6	10.0	40.6	52.5
Companion	21.3	13.1	7.5	30.6	27.5	58.1	34.4
3. I'm worried about me/him/her being in pain or having unpleasant symptoms							
Patient	20.0	16.9	10.0	35.0	18.1	53.1	36.9
Companion	7.5	7.5	1.9	40.0	43.1	83.1	15.0
4. The explanations they give about the problem seem confusing							
Patient	36.3	26.9	15.0	14.4	7.5	21.9	63.1
Companion	22.5	24.4	17.5	18.8	16.9	35.6	46.9
5. I understand why I am /he/she is receiving this treatment							
Patient	6.3	9.4	10.0	32.5	41.9	15.7	74.4
Companion	18.1	10.0	13.8	26.3	31.9	28.1	58.2
6. Doctors say things that could be interpreted in different ways							
Patient	40.0	27.5	13.8	15.6	3.1	18.8	67.5
Companion	29.4	18.1	19.4	21.9	11.3	33.1	47.5
7. I have been given different opinions about my/the illness							
Patient	43.8	28.1	15.0	9.4	3.8	13.1	71.9
Companion	32.5	15.6	19.4	21.9	10.6	32.5	48.1
8. Since I'm here I don't know what it is going to happen							
Patient							
Companion	19.4	16.3	9.4	30.0	25.0	55.0	35.6
9. The information about the tests' results seems confusing							
Patient	28.8	23.1	25.0	13.1	10.0	23.1	51.9
Companion	27.5	15.0	18.8	22.5	16.3	38.8	42.5
10. It is proven that the treatment I am/he/she is receiving works							
Patient	1.9	3.1	27.5	40.0	27.5	5.0	67.5
Companion	9.4	11.9	36.3	26.3	16.3	21.3	42.6
11. Doctors and nurses use a language. so I can understand what they are explaining to me							
Patient	3.8	1.3	9.4	40.6	45.0	5.1	85.6
Companion	11.9	4.4	20.6	27.5	35.6	16.3	63.1
12. I don't know if when I leave the problem will be solved							
Patient	21.3	26.9	11.9	28.8	11.3	40.0	48.1
Companion	17.5	11.3	15.6	30.6	25.0	55.6	28.8

ESINESU: Scale of Uncertainty before Illness in the Emergency Department. *n = 160. ** n = 160. ¹Percentage of negative responses (values 4 and 5 of the Likert scale except for items 5, 10 and 11). ²Percentage of positive responses (values 1 and 2 of the Likert scale except for items 5, 10 and 11).

Table 4. Response values on the perception of the information received

Valued aspects	Score assigned on the Likert scale (%)					% negative answers ¹	% positive positiv ²
	1	2	3	4	5		
Amount of information received							
Patient	3,1	6,9	18,1	38,8	33,1	10,0	71,9
Companion	15	10,6	31,3	21,3	21,9	25,6	43,1
Clarity of the received information							
Patient	1,9	7,5	20,6	33,1	36,9	9,4	70,0
Companion	11,9	16,9	18,1	30,0	23,1	28,8	53,1
Waiting time for the information							
Patient	5,6	17,5	26,9	28,1	21,9	23,1	50,0
Companion	28,8	22,5	18,8	18,8	11,3	51,3	30,0
Quality of the information received							
Patient	1,9	7,5	25,6	37,5	27,5	9,4	65,0
Companion	14,4	18,1	31,3	18,8	17,5	32,5	36,3
Global perception of the information received ³							
Patient	2,5	8,1	23,1	34,4	31,9	9,4	65,0
Companion	13,1	21,3	25,0	21,9	18,8	32,5	36,3

¹Percentage of negative responses (values 1 and 2 of the Likert scale). ²Percentage of positive responses (values 4 and 5 of the Likert scale). ³Arithmetic Mean of the four previous aspects.

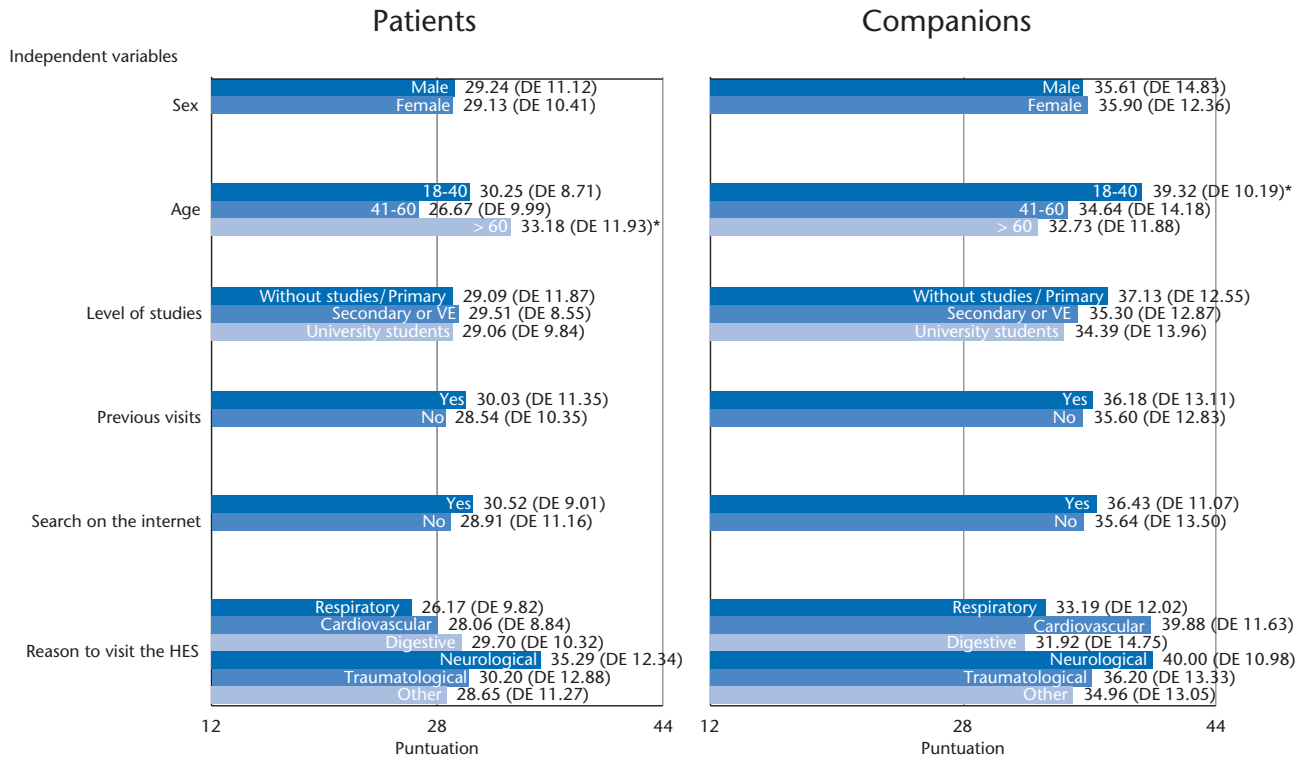


Figure 1. Degree of uncertainty in patients and companions, according to ESINESU, regarding sociodemographic and clinical-care variables (minimum: 12 points, maximum: 60 points).

* Statistical significance $p < 0.05$ in the differences in the degree of uncertainty with respect to the age groups.

HES: hospital emergency service. ESINESU: Uncertainty illness scale in the Emergency Services

lity, corroborate it, as proposed by Mishel in terms of the convenience of adapting the scale to different populations¹⁰.

The Mishel scale has been tested in different patient samples, processes and scenarios. In recent years it has been adapted to patients with heart and kidney diseases¹¹, as well as to women with breast cancer¹². The Spanish validation of the MUIS-C community version was carried out with people with chronic renal failure on hemodialysis treatment⁷. In other contexts, it has been proven how the degree of uncertainty, measured with the Mishel scale, predicts the behavior of self-care¹³, resulting in this aspect of interest for new investigations. In patients with multiple sclerosis, uncertainty has also been measured in relation to their spiritual well-being¹⁴. The MUIS-C has been previously used to investigate the relationship between uncertainty, quality of life and perceived social support in women survivors of breast cancer¹⁵ or the risk of deterioration of quality of life in young people with asthma¹⁶.

We, the professionals, have a new tool to assess the degree of uncertainty and incorporate it into clinical assessment. Given the context of application, a brief and easy-to-understand instrument was sought, responding to the need to have scales with a reasonable format in terms of comprehension, time of completion and ease of use in healthcare practice⁸ and in

the programs or strategies of continuous improvement of quality in HES.

The internal consistency values were higher than 0.90, that is, excellent¹⁷. This enables this scale for use in applied research¹⁸. The two dimensions described in its original version³ and in its Spanish adaptation⁷ were confirmed: complexity and ambiguity.

Two of the items (1 and 10) differed in size between the patients' version and that of the companions. Regarding the 1, patient version, it seems understandable that this item whose content is about questions of the health problem, is located in the complexity dimension, because it is related to the information and knowledge of who lives the problem. For the version of companions, that item is positioned in dimension 2, ambiguity, which is also explainable since the questions from those who do not live the process personally can be linked more to a situation of ambiguity regarding the prognosis and evolution of the patient. Something similar happens with item 10, which deals with the simplicity in the language used by professionals. In the patient version that item is located in the complexity dimension, for reasons similar to those explained above with item 1 for patients, while in the version of companions the understanding of what is happening, for those who do not live the problem in the first person, it can be related again to a context of ambiguity.

Table 5. Analysis of psychometric properties of the third version (ESINESU)

Items of the ESINESU	Analysis of items 1 to 12				Matrix of rotated components	
	AM	SD	ITC	EA	Factor 1*	Factor 2**
1. I have a lot of questions about my /the illness						
Patient	2.74	1.347	0.755	0.899	0.647	0.494
Companion	3.35	1.467	0.736	0.932	0.390	0.730
2. I don't know if I/he/she will get better or worse						
Patient	2.73	1.392	0.687	0.903	0.329	0.722
Companion	3.30	1.521	0.690	0.934	0.379	0.684
3. I'm worried about me/him/her being in pain or having unpleasant symptoms						
Patient	3.14	1.427	0.567	0.909	0.495	0.406**
Companion	4.04	1.197	0.649	0.935	0.237	0.775
4. The explanations they give about the problem seem confusing						
Patient	2.30	1.297	0.805	0.897	0.611	0.598
Companion	2.83	1.411	0.855	0.928	0.788	0.456
5. I understand why I am /he/she is receiving this treatment						
Patient	3.94	1.209	0.582	0.907	-0.732	-0.192
Companion	3.44	1.478	0.756	0.931	-0.853	-0.268
6. Doctors say things that could be interpreted in different ways						
Patient	2.14	1.197	0.748	0.900	0.737	0.418
Companion	2.68	1.39	0.819	0.929	0.721	0.485
7. I have been given different opinions about my/the illness						
Patient	2.01	1.144	0.727	0.901	0.712	0.419
Companion	2.63	1.404	0.765	0.931	0.714	0.426
8. Since I'm here I don't know what it is going to happen						
Patient	2.83	1.489	0.640	0.905	0.153	0.840
Companion	3.25	1.479	0.705	0.933	0.409	0.669
9. The information about the tests' results seems confusing						
Patient	2.53	1.303	0.624	0.906	0.256	0.710
Companion	2.85	1.455	0.709	0.933	0.558	0.516**
10. It is proven that the treatment I am/he/she is receiving works						
Patient	3.88	0.914	0.577	0.908	-0.300	-0.612
Companion	3.28	1.156	0.672	0.935	-0.564	-0.458
11. Doctors and nurses use a language, so I can understand what they are explaining to me						
Patient	4.22	0.943	0.604	0.907	-0.807	-0.139
Companion	3.71	1.316	0.708	0.933	-0.812	-0.244
12. I don't know if when I leave the problem will be solved						
Patient	2.82	1.355	0.527	0.910	0.283	0.555
Companion	3.34	1.419	0.609	0.937	0.262	0.697

AM: arithmetic mean; SD: standard deviation; ITC: item-total correlation; EA: Cronbach's alpha eliminating the element; ESINESU: Scale of Uncertainty before Illness in the Emergency Department.

* Saturation values after factorial analysis of main components. Rotation method: Varimax standardization with Kaiser. The rotation converged in 3 iterations. The higher saturation values are presented in bold.

** Items located in factor 2 by decision of the research team after qualitative analysis of their content.

Table 6. Evidence of convergent validity between the level of global uncertainty according to ESINESU and the perception of the information received

Valued aspects	Sample	Perception	n	Level of uncertainty between 12 (the least possible) and 60 the largest possible			p
				AM	SD	CI95	
Amount of information received	Patients	Very bad or bad	16	47.13	7.68	18.04-26.71	< 0.001
		Good or very good	115	24.75	8.28		
	Companions	Very bad or bad	41	48.61	6.52	20.39-26.10	< 0.001
		Good or very good	69	25.36	8.44		
Clarity of the received information	Patients	Very bad or bad	15	47.87	7.19	18.69-27.70	< 0.001
		Good or very good	112	24.67	8.41		
	Companions	Very bad or bad	46	48.76	6.59	18.51-24.19	< 0.001
		Good or very good	85	27.41	9.74		
Waiting time for the information	Patients	Very bad or bad	37	40.11	10.75	13.05-20.84	< 0.001
		Good or very good	80	23.16	7.18		
	Companions	Very bad or bad	82	43.13	10.80	14.67-21.98	< 0.001
		Good or very good	48	24.81	8.98		
Quality of the information received	Patients	Very bad or bad	15	48.67	6.17	21.71-29.18	< 0.001
		Good or very good	104	23.22	6.90		
	Companions	Very bad or bad	52	49.10	5.92	22.20-27.47	< 0.001
		Good or very good	58	24.26	7.96		

AM: arithmetic mean; SD: standard deviation; CI95: 95% confidence interval; ESINESU: Uncertainty of illness scale in emergency service

For the convergence measures, since there were no other validated instruments that evaluated uncertainty in the emergency department, correlations were found with expected variables¹⁹, such as the perception responses on information received. It was not possible to determine the stability by means of test-retest, given the characteristics of the application context (it was not feasible to administer it a second time to the participants with enough time to forget previous answers and that the clinical situation had not changed).

In our study we have a profile of male patient, of medium/advanced age, low level of studies, cardiovascular, digestive or respiratory problems, and well informed. The profile of the companion is that of a young or middle-aged adult woman, advanced studies, and worse informed, which was associated with greater uncertainty. The quality of the information received in the HES, unresolved doubts, fear and uncertainty about the health situation are proven reasons for reusing health services^{20,21}. This is also observed in our sample, since four out of ten users attended in the previous six months. The waiting time for the information was the worst valued aspect, while the best valued was the amount of information, in the patients, and clarity, in both groups. These results coincide with those of similar studies that indicate, in addition, the need to periodically regulate information, avoiding situations of post-traumatic stress when clinical situations worsen⁴. Another known aspect that improves the professional-user relationship in HESs is the self-identification by the staff, which allows increasing satisfaction and communicative bidirectionality²².

The percentages of the highest negative responses in the ESINESU were, for both samples, in item 3, on concerns about pain or symptoms that were unpleasant. It seems to be expected that one of the main concerns will be the negative physical experiences that generate suffering. It is known that when professional interventions for physical or psychological symptoms are ineffective there is a greater degree of dissatisfaction²³. On the other hand, the percentages of the highest positive responses in the ESINESU were given, also for both samples, in item 11, concerning the simplicity in the explanations of the doctors and nurses. This also agrees with what was previously commented on a highly favorable perception regarding the clarity of the information.

Patients 60 years of age or older showed more uncertainty. This could be associated to difficulties experienced by the loss of autonomy and the control of the situation when they enter a HES. The care that older people require in HESs requires interventions that improve communication, meeting their specific needs²⁴. With respect to the companions, the younger group reported greater uncertainty that can be related, as we mentioned earlier, with a lack of punctuality in the information, which can lead to worse satisfaction and mismanagement of the stressors. Other

studies point to the anguish generated by the waiting room in relatives, verbalizing concerns about the patient regarding their physical suffering and the ability to understand what is happening to them and what is explained to them⁴. Before this, interventions are required to reduce anxiety, ambiguity and inconsistency of information.

The uncertainty was also greater, according to the reason for the visit, in users who came for neurological problems compared to those who did so due to respiratory problems. This could be explained given the perception that could have, both patients and companions, regarding the severity and unpredictability in the course of these pathologies²⁵. Those who came for respiratory problems may have a lower perception of severity, understanding that these problems improve with less complex interventions²⁶. A future line of work could include new studies that analyze other factors related to the degree of uncertainty such as the employment situation, the state civil, the kinship of the companion or social support, given that they are possibly related aspects according to Mishel². In addition, the degree of uncertainty could be explored with the ESINESU by analyzing the accompanying patient binomial regarding the same clinical situation and emergency visit. Likewise, the sensitivity to change of ESINESU should be tested, after carrying out interventions in a HES to reduce the uncertainty of the disease.

Our work presented certain limitations. First, the type of sampling used could lead to selection biases. Secondly, the results cannot be extrapolated to other HESs by the different forms of work and organizational structures existing in them, our findings must be corroborated in new studies.

In conclusion, our study provides a simple, valid and reliable scale to measure the degree of uncertainty of users of a HES. The ESINESU can be useful in those who need care and information to reduce the stress and anxiety associated with the uncertainty in the visit to the emergency room, and, therefore, in quality programs in Spanish HES.

Conflicting interests

The authors declare no conflict of interest in relation to this article.

Financing

The authors declare the non-existence of external financing of this article.

Ethical Responsibilities

Informed consent was obtained from participants.

All authors have confirmed the maintenance of confidentiality and respect for patients' rights in the author's responsibilities document, publication agreement and assignment of rights to EMERGENCIAS.

Article not commissioned by the Editorial Committee and with external peer review

Acknowledgements

We want to thank the European University of the Canary Islands for having facilitated the intellectual conception and realization of an important part of this work. To the University Hospital Complex of the Canary Islands for having allowed us to collect data for the field phase, clearly contributing to make possible the execution of our study. To the patients and family members, for their kindness and predisposition at times when it is not easy to contribute to a research experience.

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